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REMARKS

The enclosed is responsive to the Examiner's Office Action mailed on November 15, 2006. At the time the Examiner mailed the Office Action claims 29-35 and 38-50, were pending. By way of the present response Applicants have added claims 51-57. Support for the new claims can be found in figure 10, and no new matter has been added. As such, claims 29-35 and 38-57 are now pending. Applicants respectfully request reconsideration of the present application and allowance of all claims now presented.

35 U.S.C. § 103 Rejections

The Examiner has rejected claims 29, 30, 31, 33, 34 and 42-50 under 35 U.S.C. § 103(a) as being unpatentable over Japanese Pat. JP05-198512 by Itsudo, et al. (hereinafter, "Itsudo"), in view of U.S. Pat. 5,531,183 by Sivaramakrishnam, et al. (hereinafter, "Sivaramakrishnam"). The basis of the rejection of claims 29, 42, and 47 are stated as:

> Itsudo teaches: ...a processing gas supply line connected to the manifold component for providing a processing gas into the manifold cavity (9; Figure 6) wherein the processing gas comprises reactive gases used for processing the wafer... is an intended use claim requirement. (Office Action page 3).

However, Applicant asserts that claim 29 relates to a wafer processing apparatus, comprising: a processing chamber defined by a lower wall, an upper wall and side walls; a manifold component located on the processing chamber and, together with the upper surface of the upper wall, defining a manifold cavity; a **processing gas supply line connected to the manifold component**; a plurality of processing gas supply openings in the upper wall, wherein a **processing gas from the manifold cavity** passes into the processing chamber, wherein the processing gas comprises **reactive gases** used for processing the wafer.

PAGE 13/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

In the rejection, page 8 of the Office Action, the Examiner correctly recognizes that Itsudo fails to disclose or suggest a **processing gas supply line connected to the manifold component**; wherein a **processing gas from the manifold cavity** passes into the processing chamber, and wherein the processing gas comprises **reactive gases** used for processing the wafer. Sivaramakrishnam is introduced in an attempt to remedy the deficiencies of Itsudo by asserting that the use of reactive gases in a showerhead manifold in Sivaramakrishnam would lead the skilled artisan to relocate the reactive gas injection port 23 in Itsudo from the processing chamber to the light source chamber 29 above the processing chamber 21. The rejection further asserts that it would be obvious "to optimize the relative location of the processing gas supply line to optimize the process gas flows as taught by Itsudo."

In the Response to Arguments on page 12 of the Office Action, the Examiner states:

> Examiner has repeatedly demonstrated, gas identity does not distinguish the pending apparatus claims from the prior art. Applicant's recited properties for an otherwise unknown "processing gas" does not structurally distinguish the apparatus of Itsudo .... Applicant's inoperability assumes that there is no gas in existence, suitable under MPEP 2144.07, that would *not* "react and form deposits inside the light source chamber" based on numerous possible light source wavelengths.

Various issues arise from the rejection presented in the Office Action.

1. Does the prior art teach **all** the **structural limitations** of the claim?
    a. Does a reactive gas inlet's location in a reaction chamber constitute a structural limitation?
2. Is it obvious to **modify Itsudo** to obtain the claimed invention?
    a. Is injecting **reactive** processing gases into the light source chamber consistent with **Itsudo's intended use** of injecting **inert** gas into the light source chamber?
    b. Does the **prior art** of record provide a motivation to **modify Itsudo**?

PAGE 14/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

3. Does Itsudo teach away from the claimed invention?
4. Does the proposed modification to Itsudo render **Itsudo inoperable**?
5. Does the proposed modification of Itsudo render Itsudo unsatisfactory for its intended purpose?
6. Does the proposed modification of Itsudo change the principle of operation of Itsudo?

Response to Issues Raised by the Rejection

1. Does the prior art teach **all** the **structural limitations** of the claim?
    a. Does a reactive gas inlet's location in a reaction chamber constitute a structural limitation?

Applicant asserts that a reactive gas inlet and gas source are structural elements of a reaction chamber. Further, the location of the reactive gas inlet is a critical feature of a reaction chamber, which can have a profound effect on the functionality of the apparatus. Similarly, the Applicant also assert that an inert gas inlet is also a structural element of a reaction chamber. Applicant asserts that it is improper to merely switch structural elements, which are very different in function, and represent them as being equivalent, without a rationale or motivation to do so.

2. Is it obvious to **modify Itsudo** to obtain the claimed invention?

MPEP 2142 states that "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and **not based on applicant's disclosure.**" The rejection fails to apply Itsudo's intended use for the inert

PAGE 15/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

gas and instead appears to rely on applicant's disclosure to provide both the intended use of the reactive gas and a motivation to modify Itsudo.

a. Is injecting **reactive** processing gases into the light source chamber consistent with **Itsudo's intended use** of injecting **inert** gas into the light source chamber?

MPEP 2144.07 requires that the substitution of a known material based on its suitability for **its intended use** be satisfied to support a *prima facie* obviousness determination. However, the intended use at issue is that of **Itsudo**, and **not** of the claimed structure. The issue is if it is obvious to modify Itsudo by changing the inert gas in Itsudo with the reactive processing gases of Itsudo that feed into the processing chamber. Therefore, the criteria for obviousness is measured by the intended use of the inert gas being injected into the light source chamber of Itsudo. Itsudo uses inert gas to specifically keep out and exclude processing reactants, which is the intended use that the substitution material must satisfy to establish obviousness. Therefore, substituting reactive processing gases for inert gases is unsuitable for the intended use of excluding processing gases from the light source chamber. The rejection is improper and fails to clearly define the intended use of the material to be replaced.

b. Does the **prior art** of record provide a motivation to **modify Itsudo**?

MPEP 2143.01 requires that the prior art must suggest the desirability of the claimed invention. The rejection asserts a motivation to add Sivaramakrishnam's gas supplies and for Itsudo to optimize the relative location of his processing gas supply line opening ..., which relies on Applicant's disclosure to provide where to provide gas supplies and how to

PAGE 16/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

optimize the relative location of process gas supply lines. Itsudo disclosure advocates optimizing by injecting reactive gases in the processing chamber and not in the light source chamber. In fact, the motivation provided by Itsudo teaches away from the claimed invention and the proposed modification.

3. Does Itsudo teach away from the claimed invention?

MPEP 2143.02 requires a reasonable expectation of success in the modification of the Itsudo apparatus, which is a low temperature photo-assisted CVD apparatus. The reason for the flow of inert gas into the chamber is to isolate the light source from reactants to prevent deposits on the light source. Therefore, Itsudo teaches away from the introduction of **any processing reactants into the light source chamber**, and thus teaches away from the combination and from the claimed invention.

4. Does the proposed modification to Itsudo render **Itsudo inoperable**?
5. Does the proposed modification of Itsudo render Itsudo unsatisfactory for its intended purpose?
6. Does the proposed modification of Itsudo change the principle of operation of Itsudo?

Applicants assert that the proposed combination has **no reasonable expectation of success** and renders the apparatus in Itsudo **inoperable**. Examiner's attention is directed to Itsudo par. [0002], which discloses that a **purging inert gas** is used in the light source chamber 29 to **prevent dirt deposits** on the **perforated plate**. Further, at the end of par. [0004], Itsudo discloses a light source 11 that emits a wavelength suitable for photochemical

PAGE 17/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

reaction of the processing gas. Par. [0005] continues to disclose that a reaction by the light source of suitable wavelength results in a thin film deposit on the substrate being processed. Also disclosed is that the inert gas through the quartz plate serves to prevent adhesion onto the light source and the quartz plate, which is transparent, see par. [0009].

Therefore, if processing gas is introduced into the light source chamber, as proposed in the rejection of the Office Action, then the light source, having a suitable wavelength for photochemical reaction with the processing gas would cause the processing gas in the light source chamber to react and form deposits inside the light source chamber. These deposits would quickly cover the light source and the quartz perforated plate, preventing the light to reach the processing chamber, rendering the apparatus inoperable.

On page 12 of the Office Action, the Examiner states:

"inoperability assumes that there is no gas in existence, suitable under MPEP 2144.07, that would *not* "react and form deposits inside the light source chamber" based on numerous possible light source wavelengths."

However, inoperability is based on the proposed modification, which is to switch the inert gas source with the reactive gas source of Itsudo. In addition, the light source used in Itsudo is stated to being designed to promote a reaction of the reactive gas source being used. The rejection modifies Itsudo with the elements found in Itsudo, which are designed to react and deposit material. It is improper to modify Itsudo further with features that would render Itsudo inoperable for its intended use. The argument proposed by the Examiner broadens the features found in the prior art of Itsudo and improperly further modifies the rejection, which seem to include features found only in Applicant's disclosure.

PAGE 18/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim. Nonetheless, the following remarks regarding the Examiner's rejections and the amended claims may be helpful to expedite prosecution.

Claim 56 relates to an apparatus, wherein the reactive gases used for processing the wafer enter the processing chamber **only** from the plurality of processing gas supply line openings between the manifold cavity and the processing chamber.

None of the prior art of record disclose or suggest the limitation of supplying reactive processing gases from **only** the opening between the manifold cavity and the processing chamber. Further, Itsudo teaches away from the limitation by supplying processing gas from the side.

Claim 57 relates to an apparatus, wherein the **side walls** of the processing chamber **prevent reactive gases** used for processing the wafer from entering the processing chamber through the side walls while the wafer is being processed. None of the prior art of record disclose or suggest the limitation of the **sidewalls preventing processing gases from entering the chamber.** Further, Itsudo teaches away from the limitation by supplying processing gas from the side.

Applicants assert that claims 29, 30, 31, 33, 34 and 42-50 rejected as unpatentable under 35 U.S.C. § 103(a) over "Itsudo" in view of "Sivaramakrishnam" has been overcome and the claims are now in condition for allowance.

PAGE 19/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

The Examiner has rejected claims 32, 35, 38, 39, and 40 under 35 U.S.C. § 103(a) as being unpatentable over "Itsudo" and " Sivaramakrishnam" in view of U.S. Pat. 6,444,039 by Nguyen (hereinafter, "Nguyen"). In light of the amendment, the Examiner's rejections have become moot. Nonetheless, the following remarks regarding the Examiner's rejections and the amended claims may be helpful to expedite prosecution.

Nguyen is introduced to disclose a gas distribution plate having angular displacement. However, Nguyen fails to remedy the deficiencies discussed above. Nguyen fails to disclose or suggest a **processing gas supply line connected to the manifold component**; a plurality of processing gas supply openings in the upper wall, wherein a **processing gas from the manifold cavity** passes into the processing chamber, wherein the processing gas comprises **reactive gases** used for processing the wafer; nor wherein the processing gas supply openings are **non-uniformly distributed** over the upper wall. Similarly, as discussed above, Itsudo teaches away from the introduction of processing gases into the light source chamber, and thus would not be combinable with Nguyen.

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim.

Applicants assert that claims 32, 35, 38, 39, and 40 rejected under 35 U.S.C. § 103(a) as being unpatentable over "Itsudo" and " Sivaramakrishnam" in view "Nguyen" are in condition for allowance.

PAGE 20/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26

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FEB 16 2007

CONCLUSION

Applicant respectfully submits that the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Mr. Neal Berezny at (408) 962-7563 or Mr. Michael A. Bernadicou at (408) 962-7563.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

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PAGE 21/21 * RCVD AT 2/16/2007 2:52:33 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/5 * DNIS:2738300 * CSID:408 720 9397 * DURATION (mm-ss):06-26